



#### 4.0 SCREENING OF ALTERNATIVES

As discussed in **Section 2.0**, all of the alternatives developed for the US 31 Plymouth to South Bend project were evaluated to determine if they would be carried forward for evaluation in the Draft Environmental Impact Statement (DEIS). A two-phase process was used to screen each alternative. During Phase 1, alternatives were screened with respect to the *Draft Purpose and Need Statement* for this project. **If an alternative did not meet the Purpose and Need (i.e. reduce congestion, improve safety, and improve statewide mobility), it did not advance to Phase 2, the Social and Environmental screening.**

The following subsections discuss the screening evaluation for this project. Sections 4.1 and 4.2 give an overview of the Phase 1, Purpose and Need, and Phase 2, Social and Environmental screening measures, respectively. Section 4.3 discusses the advantages, disadvantages, and recommendations for Options 1 and 2 for Alternatives B – F. Sections 4.4 – 4.14 discuss the Phase 1 screening and Phase 2 screening (if applicable) and recommendations for the freeway Alternatives A – K.

#### **4.1 Purpose and Need Evaluation**

As subsequently demonstrated, the closer a build alternative is to the existing US 31 alignment, the more effective the build alternative is in addressing the purpose and need for the US 31 Improvement Project. Proximity to the existing alignment translates into the effectiveness in diverting traffic from the existing facility so as to reduce congestion, improve safety and determine consistency with statewide (INDOT) and regional (MACOG) transportation plans

##### **4.1.1 Purpose 1 (Congestion)**

Table 4.1.1 shows resulting residual traffic volumes on the existing US 31 when any of the alternatives are constructed. The goal of the build alternative is to divert traffic from existing US 31 on to the new alternative. Table 4.1.1 shows the extent to which each build alternative achieves an acceptable level-of-service in the year 2030 for the existing US 31 Corridor from US 30 to US 20. Because the build alternatives are four-lane freeways in the rural area with some six-lane segments near the US 20 Bypass, traffic experiences acceptable operating conditions of LOS C or better when using the build alternative in rural segments, and LOS D or better for urban segments. Accordingly, the achievement of an acceptable level-of-service focuses on the residual traffic remaining on the existing US 31 alignment.

Substantiating the assessment of the relief of congestion on existing 31 is the amount of residual vehicle-miles of travel (VMT) and vehicle-hours of travel, referring to Table 4.1.2. VMT measures the directness of route to the travel desire line, and VHT measures congested travel time.



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**Table 4.1.1: Build Alternative Future Traffic and Level-Of-Service on Existing US 31 (Daily Traffic Volumes (LOS) in Year 2030 – Unacceptable LOS\* shaded in pink)**

Alternatives	Segments							
	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Urban
	US 30 to Michigan Road	Michigan Road to US 6	US 6 to Tyler Road	Tyler Road to Lake Trail	Lake Trail to SR 4	SR 4 to New Road	New Road to Roosevelt Road	Roosevelt Road to US 20 Bypass
No Build	21,504(C)	28,707(E)	25,687(F)	25,911(D)	28,279(F)	29,714(F)	32,485(F)	43,512(F)
A		16,065(B)	12,454(D)	12,622(B)	14,922(E)	16,031(C)	18,810(C)	33,766(F)
B	2,628(A)	5,608(A)	3,108(A)	3,454(A)	5,914(B)	6,259(A)	24,108(E)	35,889(F)
C	2,532(A)	5,542(A)	3,002(A)	3,285(A)	4,793(A)	3,775(A)	7,568(A)	21,932(D)
D	2,625(A)	5,622(A)	2,998(A)	3,253(A)	4,529(A)	1,985(A)	5,609(A)	10,612(B)
E	2,546(A)	5,467(A)	2,827(A)	3,103(A)	4,699(A)	2,291(A)	5,659(A)	7,002(B)
F	2,545(A)	5,389(A)	2,826(A)	3,095(A)	4,489(A)	5,209(A)	1,690(A)	
G	2,979(A)	6,181(A)	3,516(A)	3,761(A)	3,971(A)	4,975(A)	8,029(A)	8,992
H	9,861(A)	16,451(C)	14,408(D)	14,690(B)	16,433(E)	17,568(C)	20,363(D)	34,356(F)
I	11,225(B)	18,953(C)	17,137(E)	17,436(C)	19,515(F)	21,093(D)	23,783(E)	35,583(F)
J	541(A)	3,507(A)	2,354(A)	2,634(A)	4,971(B)	2,619(A)		
K	3,246(A)	6,511(A)	4,278(A)	4,488(A)	5,542(B)	6,309(A)	9,228(B)	25,406(F)

\*A LOS C is the minimum acceptable for rural segments. A LOS D is the minimum acceptable for urban segments.  
Source: Bernardin-Lochmueller & Associates, Inc. for US 31 Regional Travel Model

**Table 4.1.2: US 31 Residual Vehicle-Miles of Travel and Vehicle-Hours of Travel by Alternative (in Year 2030 – poorest performers shaded in pink)**

Alternatives	VMT			VHT		
	miles	% change from No Build	rank	hours	% change from No Build	rank
No Build	488,498			8,721		
A	211,754	-57%	9	3,694	-58%	9
B	146,804	-70%	8	2,634	-70%	8
C	74,744	-85%	6	1,306	-85%	6
D	57,826	-88%	4	1,008	-88%	4
E	47,398	-90%	3	804	-91%	3
F	41,993	-91%	2	703	-92%	2
G	63,189	-87%	5	1,064	-88%	5
H	251,749	-48%	10	4,380	-50%	10
I	293,336	-40%	11	5,133	-41%	11
J	26,241	-95%	1	450	-95%	1
K	95,095	-81%	7	1,655	-81%	7

Source: Bernardin-Lochmueller & Associates, Inc. for US 31 Regional Travel Model



A secondary measure for assessing the effectiveness of the build alternatives in relieving congestion is the reduction with VMT and VHT in the South Bend Metropolitan Area (Elkhart, Marshall and St. Joseph counties) with an unacceptable level-of-service (i.e., LOS D, E or F). This performance measure addresses how well this single improvement addresses congestion problems throughout the Metro area (not just congestion on US 31). VMT measures the directness of route to the travel desire line, and VHT measures congested travel time. As people are willing to travel greater distances to save travel time, VHT is a more important consideration than VMT. Table 4.1.3 shows that the rankings for the alternatives.

### 4.1.2 Purpose 2 (Safety)

Table 4.1.4 shows the extent to which each build alternative reduces total accidents along existing US 31 and in the Metro area (Elkhart, Marshall and St. Joseph counties). Again, the build alternatives that divert the most traffic from existing US 31 result in the best performance. The reduction of accidents in the Metro area is a secondary consideration that examines the extent to which this improvement project alone reduces the level of accidents throughout the Metro area (not only US 31).

**Table 4.1.3: Metro Congested Vehicle-Miles of Travel and Vehicle-Hours of Travel by Alternative (in Year 2030 -poorest performers shaded in pink)**

Alternatives	VMT over LOS C			VHT over LOS C		
	miles	% change from No Build	Rank	hours	% change from No Build	Rank
No Build	2,509,904			68,867		
A	2,355,943	-6.13%	6	67,520	-1.96%	11
B	2,393,659	-4.63%	10	66,245	-3.81%	9
C	2,409,697	-3.99%	11	67,052	-2.64%	10
D	2,363,255	-5.84%	8	65,745	-4.53%	6
E	2,360,917	-5.94%	7	65,662	-4.65%	5
F	2,366,349	-5.72%	9	65,762	-4.51%	7
G	2,346,618	-6.51%	5	65,322	-5.15%	3
H	2,337,643	-6.86%	3	65,315	-5.16%	2
I	2,292,760	-8.65%	1	66,235	-3.82%	8
J	2,359,906	-5.98%	4	65,614	-4.72%	4
K	2,341,562	-6.71%	2	65,003	-5.57%	1

Source: Bernardin-Lochmueller & Associates, Inc. for US 31 Regional Travel Model



**Table 4.1.4: Existing US 31 and Metro Reduction in Total Accidents by Alternative (in Year 2030, poorest performance in shaded pink)**

Alternatives	Existing US 31 Total Accidents			Metro Area Total Accidents		
	Crashes	% change from No Build	Rank	Crashes	% change from No Build	Rank
No Build	375			11,242		
A	178	-53%	9	10,966	-2.19%	6
B	151	-60%	8	11,043	-1.77%	7
C	67	-82%	6	11,074	-1.49%	10.5
D	49	-87%	5	11,074	-1.49%	10.5
E	36	-90%	3	10,963	-2.48%	4
F	25	-93%	2	10,959	-2.52%	3
G	48	-87%	4	10,965	-2.46%	5
H	204	-46%	10	11,063	-1.59%	8
I	238	-37%	11	10,067	-1.56%	9
J	16	-96%	1	10,941	-2.68%	1
K	83	-78%	7	10,951	-2.59%	2

Source: Bernardin-Lochmueller & Associates, Inc. for US 31 Regional Travel Model

### 4.1.3 Purpose 3 (Consistency with Transportation Plans)

The alternatives will be evaluated for consistency with the INDOT 2000-2025 Long Range Plan for the Statewide Mobility Corridors and with the MACOG Transportation Plan. In the INDOT 2000-2025 Long Range Plan, US 31 is shown as a Statewide Mobility Corridor and a Commerce Corridor. The MACOG Transportation Plan identifies the need to improve existing US 31.

## 4.2 Social and Environmental Evaluation

The social and environmental evaluation involved quantifying potential impacts to the resources/issues discussed in **Section 2.2**. Table 4.2.1 shows the results of the environmental evaluation for the eleven (11) build alternatives, and Options 1 and 2 for alternatives B – F. Although not all alternatives were advanced to the Phase 2 screening, all are included in the table for comparison purposes. A more detailed table of potential impacts of each alternative can be found in Appendix B.

Impacts shown in Table 4.2.1 are to be considered “potential impacts,” as the study corridors are currently 2,000 feet wide. The impact evaluations were based on a “working alignment” ranging from 300 – 500 feet wide, located roughly in the center of each corridor. In reality, an alignment could be located anywhere within the 2,000-foot corridor. Depending on the expected type of interchange, a 500- or 1000- foot radius circle was incorporated into the working alignment at the potential interchange location.



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**Table 4.2.1 : Social and Environmental Measures Summary**  
**(Alternatives Recommended for Further Study Shaded in Green,**  
**Alternatives that Did Not Meet Purpose and Need Shaded in Gray\*)**

	Western Alternatives									Central Alternatives			Eastern Alternatives			
	A	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	J	G	H	I	K
Preliminary Average Cost Estimate (million \$)	224	235	225	253	245	263	255	278	266	325	313	346	283	239	272	268
New Right-of-Way (acres)	1051	1120	1141	1050	1071	1130	1152	985	1008	917	961	857	1043	1144	1295	1083
Forest (acres)	178	222	256	162	196	146	178	114	148	75	111	55	117	111	84	82
Wetlands (acres)	39	55	63	77	85	74	81	74	82	48	57	28	43	30	38	29
Floodplains (acres)	11	11	11	11	11	11	11	11	11	11	11	11	35	35	48	35
Streams Impacted	14	10	11	11	12	12	13	11	12	8	9	8	12	14	15	16
Potential 4(f) Property Impacts	3	6	4	2	0	2	1	5	3	5	3	5	4	3	2	3
Managed Land Impacts	7	8	10	5	7	6	8	6	8	5	7	4	5	5	7	6
Unique Geological/ Ecological Area	H	H	H	M	M	M	M	M	M	L	L	L	L	L	L	L
Farmland (acres)	856	869	855	824	810	809	797	755	742	727	731	702	833	1026	1207	941
Notable Wildlife Habitat (IDNR)	0	7	7	2	2	2	2	2	2	1	1	0	1	1	1	1
Residential Relocations	62	103	73	78	48	155	125	146	116	202	172	235	113	55	40	122
Farm Relocations	13	8	4	8	4	8	4	8	4	10	6	10	8	14	12	14
Business Relocations	7	7	4	11	8	46	43	84	81	94	91	86	80	4	4	16
Environmental Justice Issues	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Well-Head Protection Area Impacts	0	4	4	4	4	4	4	3	3	2	2	2	0	1	3	0
Archaeology Impacts (Previously Surveyed)	3	4	2	4	2	4	2	4	2	4	2	3	2	18	9	4
Historic Property Impacts (on NR or PE)**	3	9	7	2	2	0	0	1	1	1	1	2	2	6	5	4
Cemeteries Impacted	1	0	0	0	0	0	0	2	2	4	4	4	2	1	1	2
Potential Residential Noise Impacts	47	38	24	69	54	115	101	82	66	105	88	146	66	30	41	75
Hazardous Material Site Impacts	1	0	0	0	0	6	6	10	10	11	11	13	10	0	1	1

\*Alternative recommendations are discussed in detail in Sections 4.3 – 4.14.

\*\*Historic Property Impacts include those properties listed on or potentially eligible for the National Register, that fall within the 2000-foot corridor for each alternative. These numbers are representative of potential Section 106 impacts.

It is important to note that the US 31 Improvement Study is a dynamic process. Much of this information is from the best known existing sources. Additional information will be identified during detailed field review later in this study, and as additional information becomes available numbers may change.



#### **4.2.1 Cost Estimates**

Preliminary engineering cost estimates have been prepared as an additional means of evaluating the study alternatives. The estimates include costs associated with the construction, right-of-way acquisition, and environmental mitigation (with respect to land purchases for wetland mitigation only) for each alternative. Construction costs included muck and peat soils considerations. Muck and peat soils contain a high percentage of organic material and require special engineering considerations. These soils must be excavated and filled in with an appropriate, more stable fill material. If they cover a large area, bridging may be necessary. Preliminary information on muck and peat soils can be found in Appendix D. At this stage of study, all costs are approximate and intended primarily for the relative comparison of alternatives.

It is anticipated that US 31 will be constructed as a four-lane divided freeway in rural areas and a four to six-lane divided freeway with median barrier in urban areas. The rural sections are assumed to have a sixty-foot wide depressed median, 10 foot outer, and 4 foot inside shoulders. The assumed road conditions have been used to determine a unit price (\$/mile) based on a state average cost for similar projects. These unit costs for roadwork and earthwork have been compiled with the associated costs of right-of-way/relocations, bridges, interchanges, traffic maintenance, local road improvements, and other items such as soil modifications and pavement removal to create a preliminary cost estimate for 2003 construction.

The summary of preliminary cost estimates is shown in Table 4.2.1. More detailed cost analyses are found in Appendix C.

#### **4.2.2 New Right-of-Way Impacted**

The total acreage of new right-of-way expected to be needed to construct each alternative, including interchanges, was calculated. The existing alignments for US 31 and US 20, and their associated interchanges, are not included in this estimate. The approximate area of new right-of-way needed for this project ranged from 857 acres to 1295 acres.

#### **4.2.3 Forest Impacts**

The total acreage of forest (includes both upland and wetland forest) potentially impacted by each build alternative was determined using digital United States Geological Survey (USGS) United States Environmental Protection Agency (USEPA) National Land Cover Data (NLCD). Potential forest impacts ranged from 55 acres to 256 acres. Generally alternatives to the west of existing US 31 tended to have higher forest impacts than those to the east.

#### **4.2.4 Wetland Impacts**

The total acreage of wetlands potentially impacted by each alternative was determined using United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) digital data. Potential wetland impacts ranged from 28 acres to 85 acres.



#### **4.2.5 Floodplain Impacts**

The total acreage of floodplains crossed by each alternative was determined using Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panels. Floodplain impacts ranged from 11 acres to 48 acres. Streams with floodplains potentially impacted include: Yellow River, Bunch Ditch, and Kline Rouch Ditch. Alternatives to the east of existing US 31 had higher floodplain impacts than those to the west or those using more of the existing facility.

#### **4.2.6 Streams Impacted**

The total number of streams crossed (includes both perennial and intermittent) was determined using USGS 7.5" topographic maps. Stream impacts ranged from eight (8) crossings to sixteen (16) crossings.

#### **4.2.7 Section 4(f) Property Impacts**

Section 4(f) of the U.S. Department of Transportation Act of 1966 requires that the Federal Highway Administration (FHWA) will not approve any program or project which requires the use of any lands from a publicly owned park, recreation area, wildlife/waterfowl refuge, or any land from an historic site of national, state, or local significance unless:

1. there is no feasible and prudent alternative to the use, and
2. all possible planning to minimize harm resulting from such use is included

In order to evaluate the alternatives based on this measure, the potential impacts on Section 4(f) properties crossed by the alternative were determined. Impacts were considered only for properties that would be directly taken for this project. For purposes of this study, Section 4(f) properties include the following:

- Historic Properties (listed on, determined eligible, or potentially eligible for the National Register of Historic Places)
- Archaeological Sites (listed on, determined eligible, or potentially eligible for the National Register of Historic Places)
- Federal Refuge Lands
- State Forest Lands
- State Parks
- City/County Park
- National Historic Landmark Property
- State Designated Nature Preserves

There are no Federal Refuge Lands or State Forest Lands located within the study area. There are no National Historic Landmark Properties within 1 mile of any of the alternatives. The Potato Creek State Park and Swamp Rose Nature Preserve (located in the northeastern corner of the Park) are located in the far western portion of the study area are very close to Alternative A, but would not be directly impacted.





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The only publicly owned recreational facilities potentially impacted are O'Brien Park (Alternatives C-G, J) located north of Ireland Road, and Newton Park (Alternative J), located near Pierce Road.

Alternative A crosses one (1) historic district potentially eligible for the National Register of Historic Places (NR) at Riley Road.

**Table 4.2.2: Potential Section 4(f) Impacts  
(Alternatives Recommended for Further Study Shaded in Green,  
Alternatives that Did Not Meet Purpose and Need Shaded in Gray\*)**

	Western Alternatives									Central Alternatives			Eastern Alternatives			
	A	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	J	G	H	I	K
<b>Historic/Archaeology Sites</b>																
Historic Properties**	2	6	4	2	0	2	0	4	2	4	2	3	3	2	1	1
Historic Districts	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
National Historic Landmark Property	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Archaeological Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL SITES</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>Public Lands</b>																
Federal Refuge Lands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
State Forest Lands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
State Parks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City/County Park	0	0	0	0	0	1	1	1	1	1	1	2	1	0	0	0
State Designated Nature Preserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL SITES</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>TOTAL POTENTIAL SECTION 4(F) IMPACTS</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>3</b>

\*Alternative recommendations are discussed in detail in Sections 4.3 – 4.14.

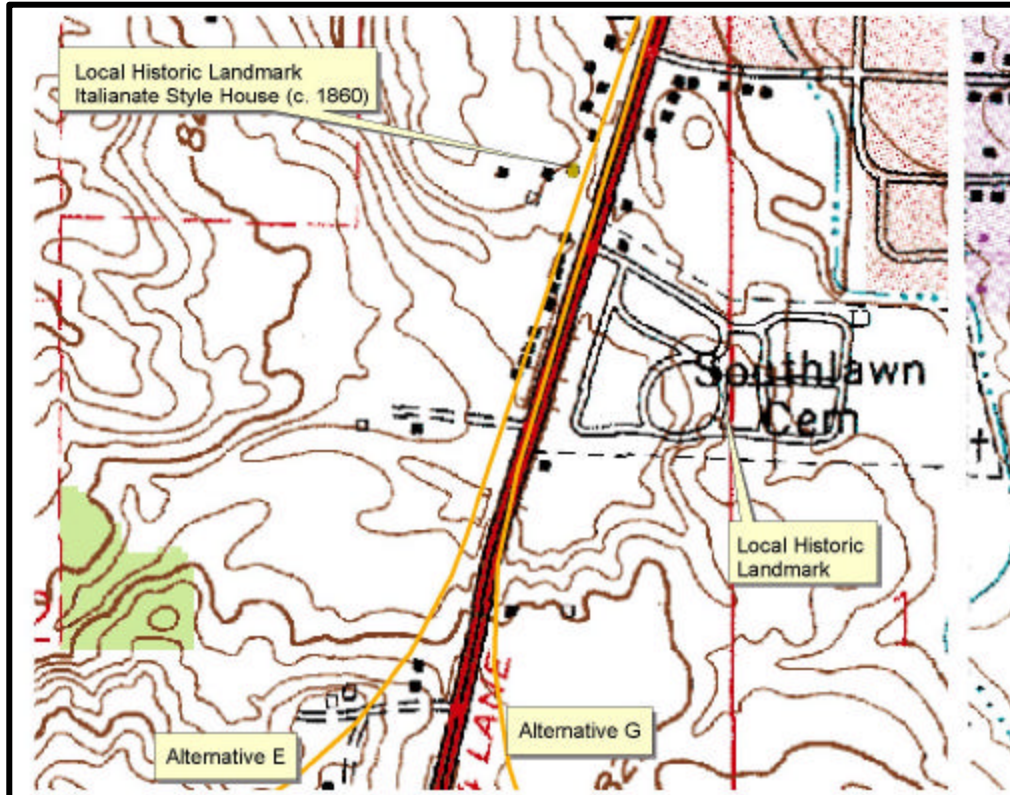
\*\*Includes sites potentially eligible for the National Register and Local Historic Landmarks.

The remaining potential Section 4(f) properties are historic properties. Of particular note are two Local Historical Landmarks located along the existing US 31, the Ullery/Farneman House, an Italianate-style house potentially eligible for the National Register (c. 1860), and the Southlawn Cemetery (Figure 4.2.1). Due to the close proximity of these two properties, it will be difficult to construct an interstate type facility without significant impact to one or both properties. Both are potential Section 4(f) issues. Alternatives E, F, G, and J may impact these properties; however, it may be possible to minimize right-of-way requirements between the properties or to shift the alternatives to connect with existing US 31 slightly north of these sites.





Figure 4.2.1: Local Historic Landmarks along US 31



Note: Alternatives F and J are not labeled, but are on the existing US 31 alignment in this area.

#### 4.2.8 Managed Land Impacts

Managed lands include properties owned and managed by public agencies. Managed lands include Section 4(f) properties that are publicly owned. For purposes of this evaluation, the following types of property were considered to be managed lands:

- Federal Refuge Lands
- State Forest Lands
- State Parks
- Wildlife Management Areas
- City/County Parks
- Nature Conservancy Lands
- University/College Property
- Nature Preserves
- Airports
- Classified Forests
- Classified Wildlife Areas



**Table 4.2.3: Potential Managed Lands Impacts**  
(Alternatives Recommended for Further Study Shaded in Green,  
Alternatives that Did Not Meet Purpose and Need Shaded in Gray\*)

	Western Alternatives									Central Alternatives			Eastern Alternatives			
	A	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	J	G	H	I	K
Federal Refuge Lands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
State Forest Lands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
State Parks	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
City/County Park	0	0	0	0	0	1	1	1	1	1	1	2	1	0	0	0
Nature Conservancy Lands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University/College Property	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nature Preserves/ Natural Areas	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Airports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potential Classified Forest Impacts	5	5	6	2	3	2	3	2	3	1	2	1	3	4	6	4
Potential Classified Wildlife Area Impacts	0	3	4	3	4	3	4	3	4	3	4	1	1	1	1	1
<b>TOTAL</b>	<b>7</b>	<b>8</b>	<b>10</b>	<b>5</b>	<b>7</b>	<b>6</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>7</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>7</b>	<b>6</b>

\*Alternative recommendations are discussed in detail in Sections 4.3 – 4.14.

There are no Federal Refuge Lands, State Forest Lands, Nature Conservancy Lands, University/College Property, National Historic Landmark Properties, or Airports expected to be impacted as part of this project.

It is important to note that the Plymouth Municipal Airport is located approximately one (1) mile north of Plymouth and 4041 feet west of the existing US 31. All alternatives are located on the existing US 31 alignment near this airport. It is possible that if tall construction equipment is used, it may impact air operations at the airport. It is anticipated these impacts can be avoided, but this matter will require coordination with the airport, as all alternatives are involved.

Managed Lands impacts range from four (4) to ten (10). The majority of these impacts are potential Classified Forests and Classified Wildlife Areas.

Although not directly crossing them, Alternative A is in very close proximity to Potato Creek State Park and the Swamp Rose Nature Preserve, located in the northeast corner of the Park. Due to possible noise, light, and runoff issues, these properties are considered impacted by Alternative A.

The City/County Parks impacted are O'Brien Park and Newton Park discussed as Section 4(f) issues in **Section 4.2.7**.



#### **4.2.9 Unique Geological/Ecological Area (Maxinkukee Moraine)**

Alternatives A and B cross the most prominent portions of the Maxinkukee Moraine in the northern portion of the study area. Alternatives C - E passes near the edge of this moraine. According to the IDNR (Coordination – November 25, 1996), “this area constitutes one of the best examples of glacially formed landscapes in northern Indiana. Prominent features include knolls which rise 50-60 feet above their basins, numerous sloughs, enclosed basins, small lakes, and ponds. Construction of either alternative (Alternatives A or B) would result in significant adverse impacts to these features as well as wetland, wildlife, and botanical resources.” This area has not been intensely surveyed for federal and state threatened and endangered species, but it is likely the state endangered/federal candidate species such as the eastern massasauga snake (*Sistrurus catenatus catenatus*), state endangered Blanding's turtle (*Emydoidea blandingii*), state endangered Kirtland's snake (*Clonophis kirtlandii*), and state endangered spotted turtle (*Clemmys guttata*), would be directly impacted by an alternative in this area.

According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle was reported within the corridor for Alternatives B – F. This report could be representative of a population of this species in the area.

#### **4.2.10 Farmland Impacts**

The acreage of potentially impacted farmland was determined for each alternative using digital USGS/USEPA NLCD. Potential farmland impacts ranged from approximately 702 acres to 1207 acres. Generally the eastern alternatives had the greatest farmland impacts, while those using the most of existing US 31 had the least.

#### **4.2.11 Notable Habitat Area Impacts**

The total number of Notable Wildlife Habitat Areas (determined by the Indiana Department of Natural Resources) crossed by each alternative was determined. Alternative B (options 1 and 2) impact the highest number of Notable Wildlife Areas, crossing a total of seven (7) Areas. Alternatives A and J had the fewest impacts with zero (0) each. It is important to note that both Alternatives A and B cross the most prominent portions of the Maxinkukee Moraine in the northern portion of the study area.

#### **4.2.12 Residential Relocations**

The total number of residential relocations were determined for each alternative using aerial photographs and preliminary field surveys, primarily from the road. Residential relocations ranged from 40 to 235. Generally, the longer an alternative used the existing US 31, the greater the residential relocations.

#### **4.2.13 Farm Relocations**

The total number of farm relocations were determined for each alternative using aerial photographs and preliminary field surveys, primarily from the road. Farm relocations are treated separately because they often represent both homes and businesses. The number of potential farm relocations ranged from four (4) to fourteen (14).



#### **4.2.14 Business Relocations**

The total number of businesses impacted were determined for each of the alternatives using aerial photographs and preliminary field surveys, primarily from the road. Business relocations ranged from 4 to 94. Generally, alternatives that used more of the existing US 31 right-of-way had higher business relocations.

#### **4.2.15 Environmental Justice Issues**

The percentage of low-income households and minority households within the study area potentially impacted by each alternative were compared to the average percentage of low-income households and minority households for St. Joseph and Marshall counties. Digital 2000 Census data was used to obtain low-income and minority household information.

No alternatives impacted a higher percentage of low-income or minority households when compared with the St. Joseph/Marshall County average.

#### **4.2.16 Well-head Protection Area Impacts**

Potential impacts to well-head protection areas were determined by calculating the total number of these areas crossed by each alternative. Digital "Public Water Supply Well" data from the Indiana Department of Environmental Management was used to obtain well locations. A 3000-foot default radius was used as the well-head protection area for each well. The number of well-head protection areas crossed ranged from zero (0) to four (4).

#### **4.2.17 Archaeology Impacts**

Previously surveyed archaeological sites were identified from a records check of site records, maps, and materials on file at the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (IDNR, DHPA) and Landmark Archaeological and Environmental Services, Inc. The total number of previously surveyed archaeological sites to be impacted was determined for each alternative. The number of previously surveyed sites impacted ranged from two (2) to eighteen (18). This number only represents those sites previously surveyed, and there may be additional sites impacted that have not yet been discovered. The preferred alternative in the Final Environmental Impact Statement will be field surveyed.

#### **4.2.18 Historic Property Impacts**

Historic property impacts were determined by calculating the total number of historic properties and districts listed on or potentially eligible for the National Register of Historic places that fall within the 2,000-foot corridor. Identifying potential historic properties continues to be an ongoing process. Sources include: Indiana Historic Sites and Structures Inventory Count Interim Reports, preliminary field surveys by a professional historian, and coordination with Section 106 Consulting Parties. Secondary sources were used for background review. Historic property impacts are more of a reflection of potential Section 106 issues rather than potential Section 4(f) issues (only properties directly within the working alignment).

Alternative A passes through a potentially eligible historic district near Riley Road, and is very close to a potentially eligible historic district at Sumption Trail.



There are two (2) sites listed on the National Register that fall within the 2000-foot corridors for the alternatives. One is the Evergreen Hill Farm that includes an Italianate-style house, c. 1873, barn, cemetery, and smokehouse. This property is located near US 20 off Keria Trail. Alternative C could potentially impact this property near its proposed interchange with US 20. The second is the Lakeville School, located along existing US 31 in Lakeville. Alternative J would potentially impact this property.

In addition to the Ullery/Farneman House, discussed in **Section 4.2.7** Section 4(f) Property Impacts, there are two (2) additional potentially eligible sites that fall within the 2000-foot corridors for the alternatives. One is the Cover House, a Prairie-style residence, c. 1920, located near US 20 off Ireland Road. Alternative C could impact this property near its proposed interchange with US 20. The second is the Francis Donaghue Farmstead that includes an Italianate-style house, c. 1861, bank barn, privy, chicken house, windmill, and well house. This property is located off Turkey Trail, and could potentially be impacted by Alternative G.

#### **4.2.19 Cemeteries Impacted**

The total number of known cemeteries impacted was determined for each alternative using preliminary field surveys, primarily from the road, and USGS 7.5" topographic maps. The number of cemeteries ranged from zero (0) to four (4). It may be possible to avoid some cemeteries by shifting the alignment within the corridor.

#### **4.2.20 Potential Residential Noise Impacts**

The total number of potential residential noise impact sites was calculated for each alternative, using 1998 aerial photographs and the Traffic Noise Model (TNM) 2.1. The number of residential noise impact sites ranged from 24 to 146. Generally those alternatives that used more of the existing US 31 right-of-way had greater numbers of residential noise impacts.

#### **4.2.21 Hazardous Material Site Impacts**

Hazardous material site impacts were determined by adding the number of Underground Storage Tanks (USTs), Leaking Underground Storage Tanks (LUSTs), Resource Conservation and Recovery Act (RCRIS) sites, and Superfund (CERCLIS) sites impacted by each alternative. There are no expected impacts to Superfund sites, therefore impact numbers constitute only UST, LUST, and RCRIS sites. The number of potential hazardous material site impacts ranged from zero (0) to 13. The majority of these sites were UST sites along existing US 31. Generally the more of the existing US 31 alignment utilized by an alternative, the greater the potential hazardous material site impacts.

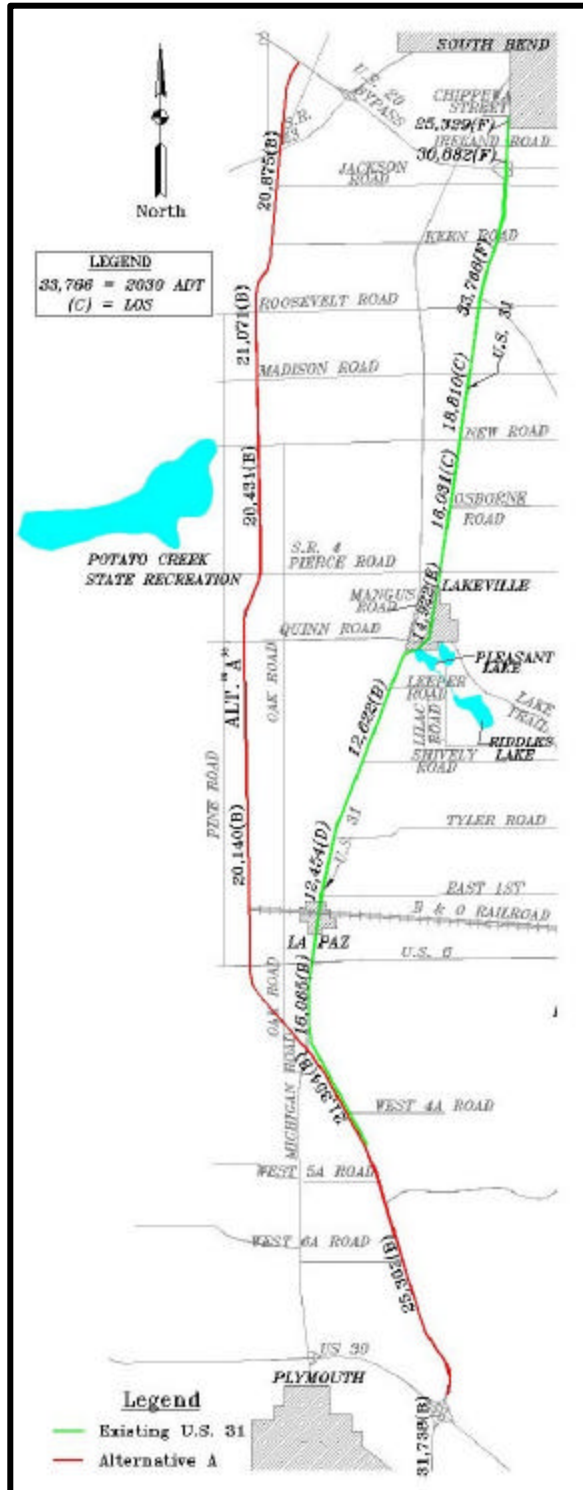




## US31 Plymouth to South Bend

### Screening Report

#### 4.3 Alternative A



Alternative A begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs west of La Paz, roughly parallels Oak Road, and ends at US 20 northwest of the existing SR 23 interchange. Alternative A is the western most alternative. It uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, Kern Road, and the US 20 Bypass. Alternative A is 21.3 miles in length, with average preliminary costs estimated at \$224 million.

#### Phase 1: Purpose and Need

**Traffic Congestion:** This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, three (3) of the eight (8) segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions.

**Traffic Safety:** This alternative fails to address the purpose of improving safety on the existing US 31 because the residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

#### Conclusion

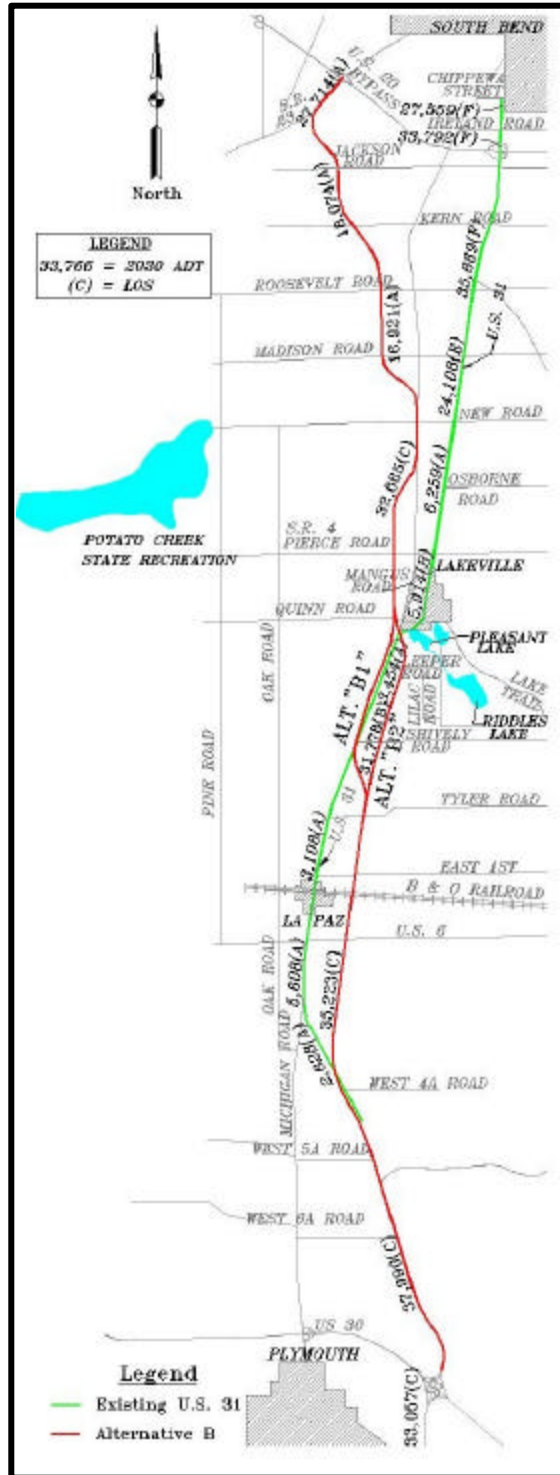
Alternative A fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.



## US31 Plymouth to South Bend

### Screening Report

#### 4.4 Alternative B



Alternative B begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville, and ends at the existing US 20/SR 23 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, Kern Road, SR 23 (partial interchange) and the US 20 Bypass. Alternative B is 21.2 miles in length, with preliminary costs estimated at \$225 million.

#### Phase 1: Purpose and Need

**Traffic Congestion:** This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, two (2) of the eight (8) segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions.

**Traffic Safety:** This alternative fails to address the purpose of improving safety on the existing US 31 because the residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety.

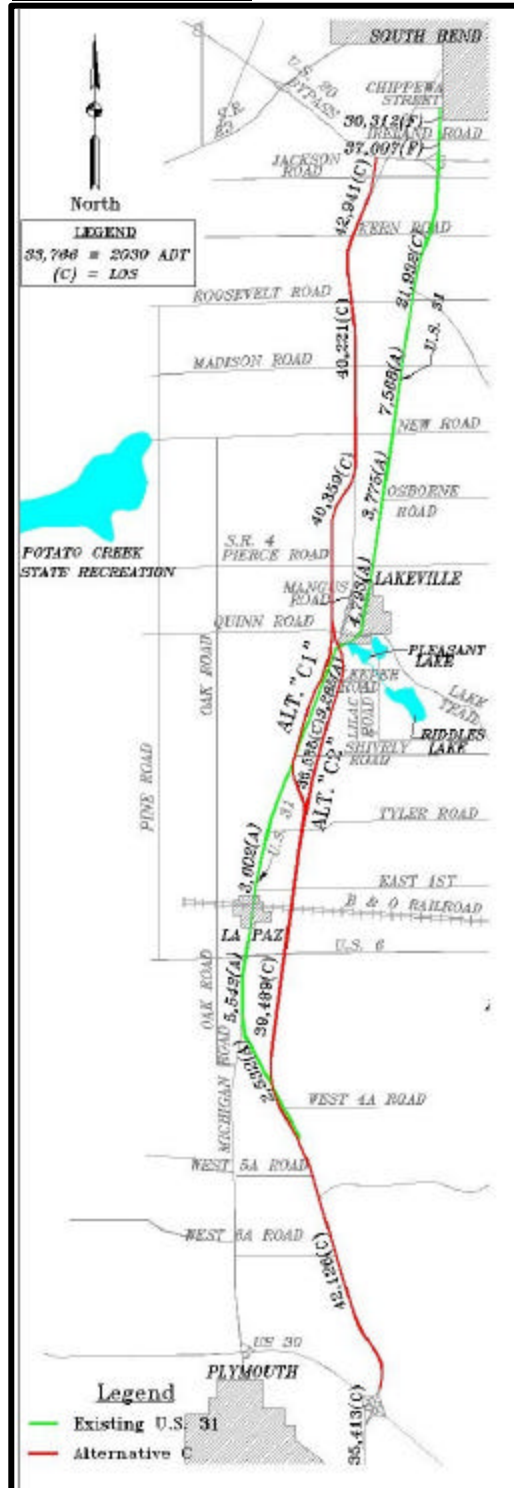
**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

#### Conclusion

Alternative B fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.



## **4.5 Alternative C**



Alternative C begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, and ends at US 20 west of the existing US 31 interchange. This four-lane rural freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, Kern Road and the US 20 Bypass. Alternative C parallels a high transmission powerline for approximately 0.5 miles near Madison Road. Alternative C is the shortest alternative at 19.5 miles in length, with preliminary costs estimated at \$245 million.

## Phase 1: Purpose and Need

**Reduce Congestion:** This alternative would reduce congestion of US 31. Projected LOS for the year 2030 range from A – C along rural segments and LOS D for the urban segment of existing US 31. These projected LOS values meet INDOT standards.

**Improve Traffic Safety:** This alternative would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No Build is 82%.

*Consistency with Transportation Plans:* This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

Alternative C meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

## Phase 2: Social and Environmental Impacts

**Option 1:** Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs, Option 1 is not recommended to be advanced for further study (see Section 4.14).

Option 2: The potential social and environmental impacts identified for Alternative C are listed in Table 4.2.1 in

**Section 4.2.** This alternative would require an estimated 1071 acres of new right-of-way, of which, 196 acres are forested, 85 acres are wetlands, 11 acres are floodplains, and 810 acres are farmland. Approximately twelve (12) streams would be crossed by the alternative. This alternative



crosses the edge of the Maxinkukee Moraine in the northwestern portion of the study area, a unique geological and ecological area. Alternative C is expected to directly impact two (2) Notable Wildlife Habitat Areas as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative C would result in approximately 48 residential, eight (8) business, and four (4) farm relocations. There are several large, industrial businesses potentially impacted near the proposed interchange with US 20. This alternative would also potentially impact seven (7) managed lands, which include three (3) classified forests and four (4) classified wildlife areas.

This alternative could potentially impact one (1) property on the National Register, and one (1) property potentially eligible for the National Register. Both properties are located near the proposed Alternative C/US 20 interchange. The property listed on the National Register is the Evergreen Hill Farm. This property includes 38 acres, with an Italianate-style house, c. 1873, barn, cemetery, and smokehouse. The Cover House is potentially eligible for the National Register. It is a Prairie-style residence built c. 1920. Both properties are possible Section 106 impacts.

It will also impact two (2) previously surveyed archaeological sites, neither of which were recommended for further study.

This alternative crosses four (4) well-head projection areas.

### Conclusion

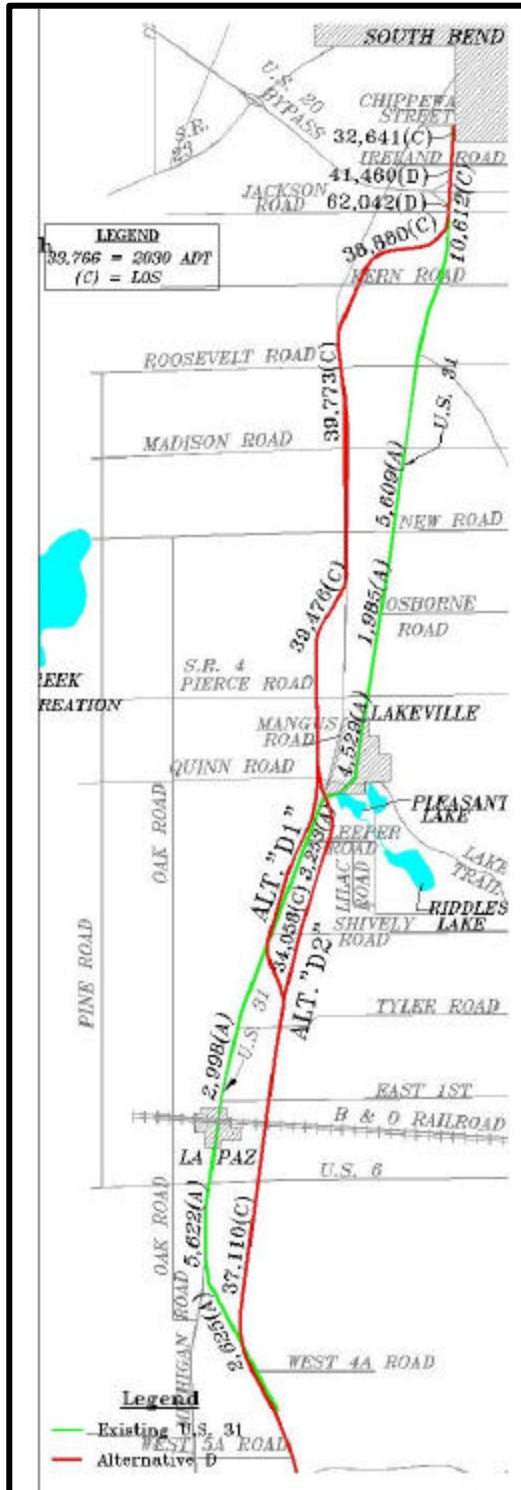
**Alternative C is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 6.0 contains those alternatives to be carried forward for further analysis in the DEIS.**



## US31 Plymouth to South Bend

### Screening Report

#### 4.6 Alternative D



Alternative D begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, Kern Road, US 31 (partial interchange), the US 20 Bypass, and Ireland Road. Alternative D is 20.9 miles in length, with preliminary costs estimated at \$255 million.

#### Phase 1: Purpose and Need

**Reduce Congestion:** This alternative would reduce congestion of US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

**Improve Traffic Safety:** This alternative would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No Build is 87%.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

Alternative D meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

#### Phase 2: Social and Environmental Impacts

**Option 1:** Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs, Option 1 is not recommended to be advanced for further study (see Section 4.14).

**Option 2:** The potential social and environmental impacts identified for Alternative D are listed in Table 4.2.1 in **Section 4.2**. This alternative would require an estimated 1152 acres of new right-of-way, of which, 178 acres are forested, 81 acres are wetlands, 11 acres are floodplains, and 797 acres are farmland. Approximately thirteen (13) streams would be crossed by the alternative. This alternative crosses the edge of the Maxinkukee Moraine in the northwestern portion of the study area, a unique geological and ecological area. Alternative D is expected to



## *US31 Plymouth to South Bend*

### **Screening Report**

directly impact two (2) Notable Wildlife Habitat Areas as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative D would result in approximately 125 residential, 43 business, and four (4) farm relocations. This alternative crosses directly through the Whispering Hills subdivision near its connection with US 31, resulting in a high number of residential relocations and neighborhood impacts. This subdivision would be virtually eliminated.

Alternative D connects to existing US 31 approximately 1/3 of a mile south of the existing US 20 interchange. The close proximity of this connection to the existing interchange creates insufficient distance to accommodate the proper weaving movements for the traffic flow.

Alternative D would impact six (6) potential hazardous material sites including: two (2) USTs, one (1) LUST, and three (3) RCRA sites.

This alternative would also potentially impact eight (8) managed lands, which include three (3) classified forests, four (4) classified wildlife areas, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

The O'Brien Park is the only potential Section 4(f) property impacted by this alternative. It will also impact two (2) previously surveyed archaeological sites, neither of which were recommended for further study.

This alternative crosses four (4) well-head projection areas.

### **Conclusion**

**Alternative D is being eliminated from further consideration based on the insufficient room for the needed geometrics in the vicinity of the US 20/US 31 interchange and a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 5.0 contains those alternatives eliminated from further consideration.**

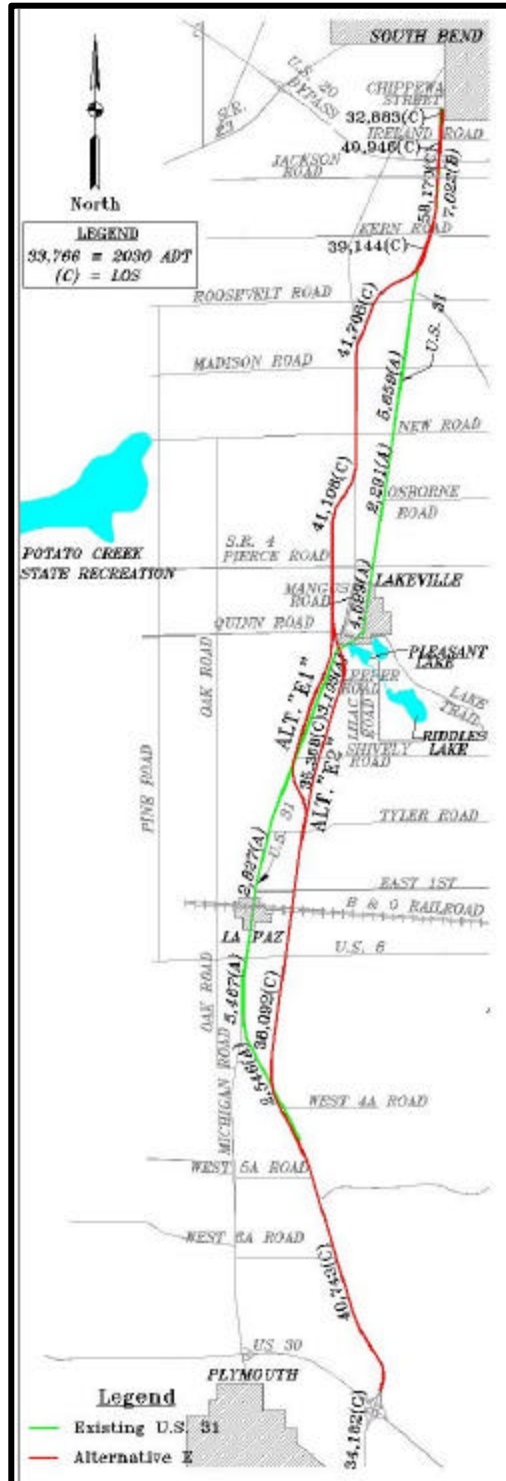




## US31 Plymouth to South Bend

### Screening Report

#### 4.7 Alternative E



**Alternative E** begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, returns to US 31 south of Kern Road, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6 SR 4 (Pierce Road), New Road, US 31 (partial interchange), Kern Road, the US 20 Bypass, and Ireland Road. Alternative E is 20.6 miles in length, with preliminary costs estimated at \$266 million.

#### Phase 1: Purpose and Need

**Reduce Congestion:** This alternative would reduce congestion on US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

**Improve Traffic Safety:** This alternative would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No Build is 90%.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

Alternative E meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

#### Phase 2: Social and Environmental Impacts

**Option 1:** Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs, Option 1 is not recommended to be advanced for further study (see Section 4.14).

**Option 2:** The potential social and environmental impacts identified for Alternative E are listed in Table 4.2.1 in **Section 4.2**. This alternative would require an estimated 1008 acres of new right-of-way, of which, 148 acres are

forested, 82 acres are wetlands, 11 acres are floodplains, and 742 acres are farmland. Approximately twelve (12) streams would be crossed by the alternative. This alternative crosses the edge of the Maxinkukee Moraine in the northwestern portion of the study area, a unique



geological and ecological area. Alternative E is expected to directly impact two (2) Notable Wildlife Habitat Areas as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative E would result in approximately 116 residential, 81 business, and four (4) farm relocations. Many of the residence and business relocations are located along the existing US 31. This alternative would also impact the Center Township Fire Department.

Alternative E would impact ten (10) potential hazardous material sites including: six (6) USTs, one (1) LUST, and three (3) RCRA sites.

This alternative would also potentially impact eight (8) managed lands, which include three (3) classified forests, four (4) classified wildlife areas, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

Potential Section 4(f) sites include O'Brien Park, the Ullery/Farneman House, an Italiante-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register) and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 4.2.1). Due to the close proximity of these two properties, it will be difficult to construct an interstate type facility in this area without significant impact to one or both properties. It may be possible to minimize right-of-way requirements between the properties or to shift Alternative E to connect with existing US 31 slightly north of these sites. Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact.

It will also impact two (2) previously surveyed archaeological sites, one (1) of which was recommended for intensive survey.

This alternative crosses three (3) well-head projection areas.

### Conclusion

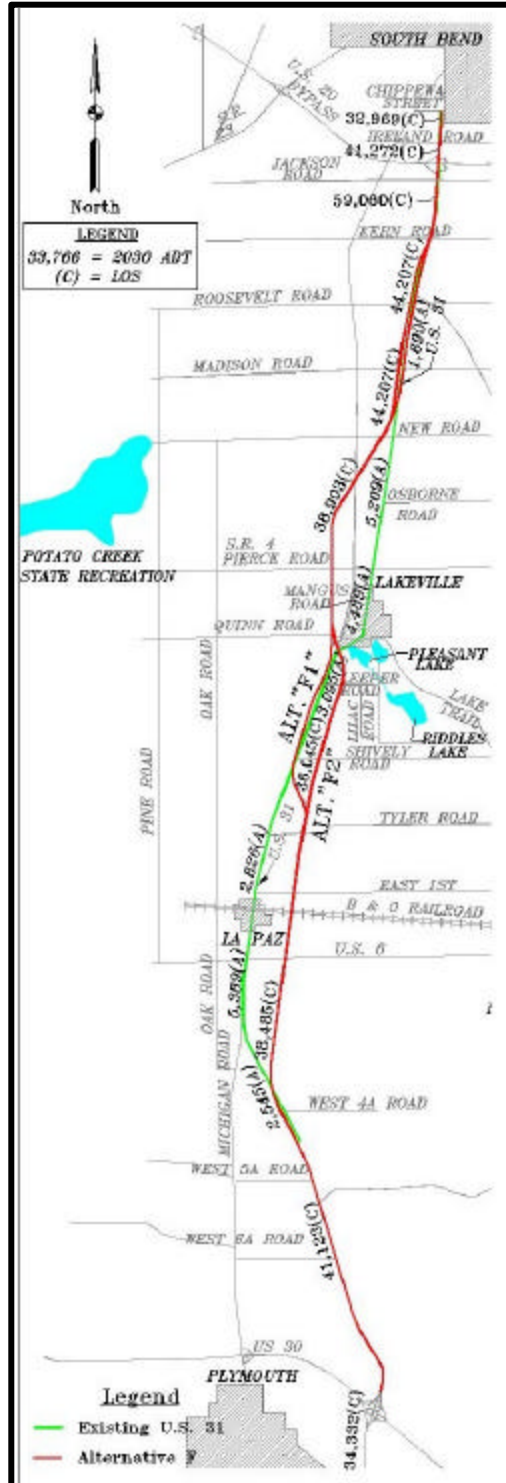
**Alternative E is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 6.0 contains those alternatives to be carried forward for further analysis in the DEIS.**



## US31 Plymouth to South Bend

### Screening Report

#### 4.8 Alternative F



Alternative F begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, returns to US 31 near New Road, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, Kern Road, the US 20 Bypass, and Ireland Road. Alternative F is 20.4 miles in length, with preliminary costs estimated at \$313 million.

#### Phase 1: Purpose and Need

**Reduce Congestion:** This alternative would reduce congestion of US 31. Alternative F has a projected LOS of A along existing US 31, and meets INDOT standards.

**Improve Traffic Safety:** This alternative would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No Build is 93%.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

Alternative F meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

#### Phase 2: Social and Environmental Impacts

**Option 1:** Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs, Option 1 is not recommended to be advanced for further study (see Section 4.14).

**Option 2:** The potential social and environmental impacts identified for Alternative F are listed in Table 4.2.1 in **Section 4.2**. This alternative would require an estimated 961 acres of new right-of-way, of which, 75 acres are forested, 57 acres are wetlands, 11 acres are floodplains, and 731 acres are farmland. Approximately nine (9)

streams would be crossed by the alternative. Alternative F is expected to directly impact one (1) Notable Wildlife Habitat Area as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle





## US31 Plymouth to South Bend

### Screening Report

(*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative F would result in approximately 172 residential, 91 business, and six (6) farm relocations. Many of the residence and business relocations are located along the existing US 31. This alternative would also impact the Center Township Fire Department.

Alternative F would impact eleven (11) potential hazardous material sites including: seven (7) USTs, one (1) LUST, and three (3) RCRA sites.

This alternative would also potentially impact seven (7) managed lands, which include two (2) classified forests, four (4) classified wildlife areas, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

Potential Section 4(f) sites include O'Brien Park, the Ullery/Farneman House, an Italiante-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register), and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 4.2.1). It may be possible to minimize right-of-way requirements between the properties or to shift Alternative F to connect with existing US 31 slightly north of these sites. Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact.

Three cemeteries, in addition to the Southlawn Cemetery, could also potentially be impacted by this alternative. It will also impact two (2) previously surveyed archaeological sites, none of which were recommended for intensive survey.

This alternative crosses two (2) well-head projection areas.

### Conclusion

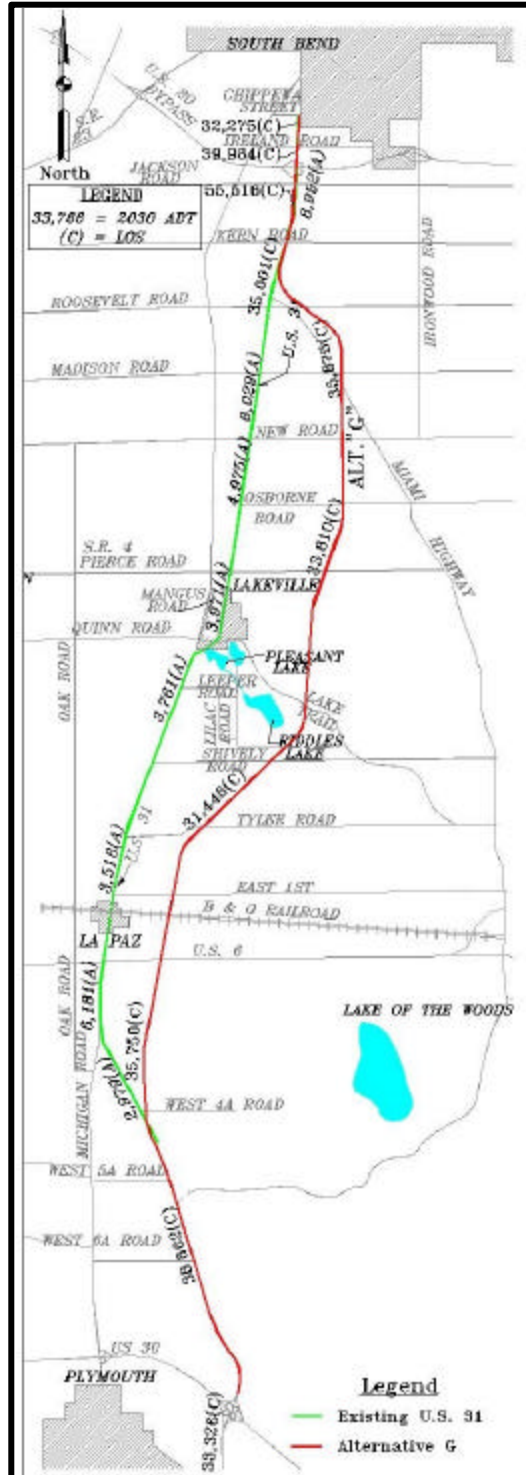
**Alternative F is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 6.0 contains those alternatives to be carried forward for further analysis in the DEIS.**



## US31 Plymouth to South Bend

### Screening Report

#### 4.9 Alternative G



Alternative G begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It runs east of Lakeville, returns to US 31 south of Kern Road, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, US 31 (partial interchange), Kern Road, the US 20 Bypass, and Ireland Road. Alternative G is 21.2 miles in length, with preliminary costs estimated at \$283 million.

#### Phase 1: Purpose and Need

**Reduce Congestion:** This alternative would reduce congestion on US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

**Improve Traffic Safety:** This alternative would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No Build is 87%.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

Alternative G meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

#### Phase 2: Social and Environmental Impacts

The potential social and environmental impacts identified for Alternative G are listed in Table 4.2.1 in **Section 4.2**. This alternative would require an estimated 1043 acres of new right-of-way, of which, 117 acres are forested, 43 acres are wetlands, 35 acres are floodplains, and 833 acres are farmland. Approximately twelve (12) streams would be crossed by the alternative. Alternative G is expected to directly impact one (1) Notable Wildlife Habitat Area as identified by the IDNR.



Alternative G would result in approximately 113 residential, 80 business, and eight (8) farm relocations. This alternative would also impact the Center Township Fire Department. Alternative G would impact ten (10) potential hazardous material sites including: six (6) USTs, one (1) LUST, and three (3) RCRA sites.

This alternative would also potentially impact five (5) managed lands, which include three (3) classified forests, one (1) classified wildlife area, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

Potential Section 4(f) sites include O'Brien Park, the Ullery/Farnemant House, an Italianate-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register), and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farnemant House and Southlawn Cemetery are located very close together along existing US 31 (Figure 4.2.1). Due to the close proximity of these two properties, it will be difficult to construct an interstate type facility in this area without significant impact to one or both properties. It may be possible to minimize right-of-way requirements between the properties or to shift Alternative G to connect with existing US 31 slightly north of these sites.

Because of its high potential to be eligible for the National Register, the Ullery/Farnemant House would also most likely be a Section 106 impact. A second potential Section 106 impact from Alternative G is the Francis Donaghue Farmstead near Turkey Trail. This property includes an Italianate-style house, c. 1861, bank barn, privy, chicken house, windmill, and well house.

It will also impact two (2) previously surveyed archaeological sites, none of which were recommended for intensive survey. One (1) cemetery, in addition to the Southlawn Cemetery could potentially be impacted by this alternative.

### **Conclusion**

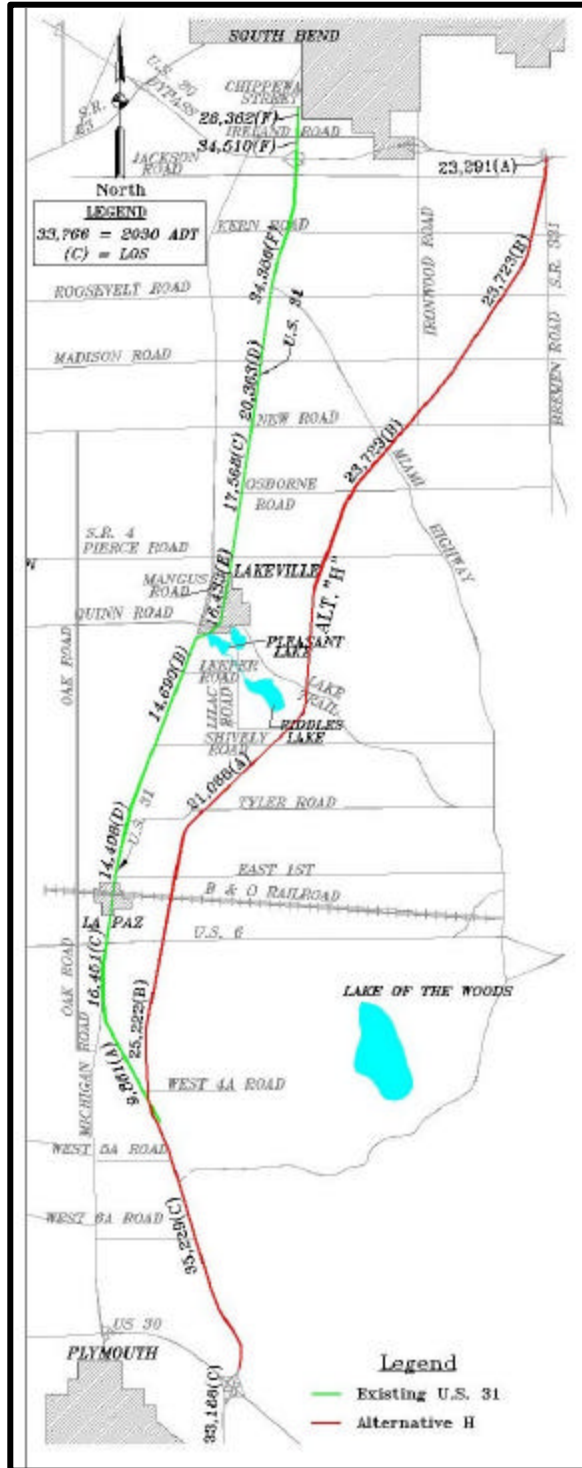
**Alternative G is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 6.0 contains those alternatives to be carried forward for further analysis in the DEIS.**



## US31 Plymouth to South Bend

### Screening Report

#### 4.10 Alternative H



Alternative H begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 east of an abandoned railroad. It runs east of Lakeville, and ends at the existing western US 20/SR 331 (Bremen Highway) interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), SR 331 (south of Kern Road), and the US 20 Bypass. Alternative H parallels a high transmission powerline corridor from near Osborne Road to Kern Road (approximately 4.6 miles). Alternative H is 20.9 miles in length, with preliminary costs estimated at \$239 million.

#### Phase 1: Purpose and Need

**Traffic Congestion:** This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, four (4) of the eight (8) segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions.

**Traffic Safety:** This alternative fails to address the purpose of improving safety on the existing US 31 because the residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

#### Conclusion

Alternative H fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.

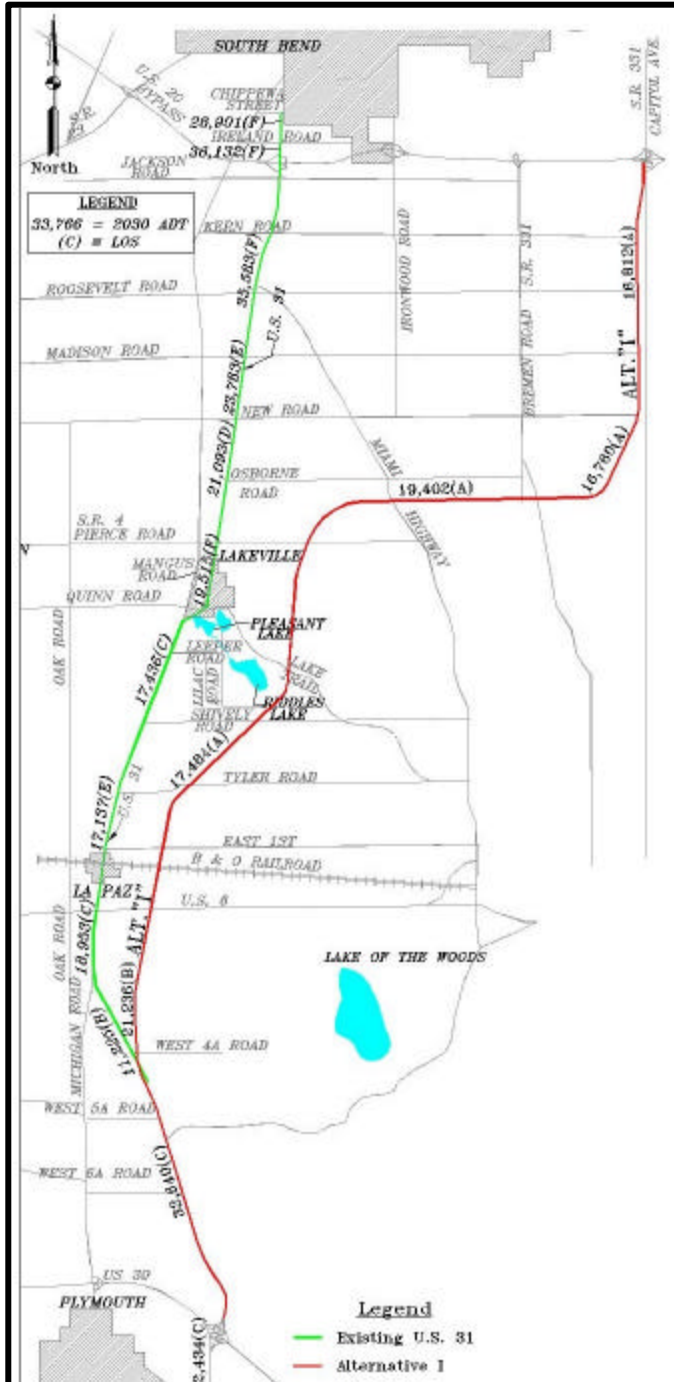




## US31 Plymouth to South Bend

### Screening Report

#### 4.11 Alternative I



Alternative I begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It runs east of Lakeville, and ends at the existing eastern US 20/SR 331 (Elm Road/Capital Avenue) interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), SR 331 (south of Osborne Road), New Road, Elm Road/Kern Road and the US 20 Bypass. Alternative I is the longest alternative at 24.3 miles in length, with preliminary costs estimated at \$272 million.

#### Phase 1: Purpose and Need

**Traffic Congestion:** This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, five (5) of the eight (8) segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions.

**Traffic Safety:** This alternative fails to address the purpose of improving safety on the existing US 31 because the residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

#### Conclusion

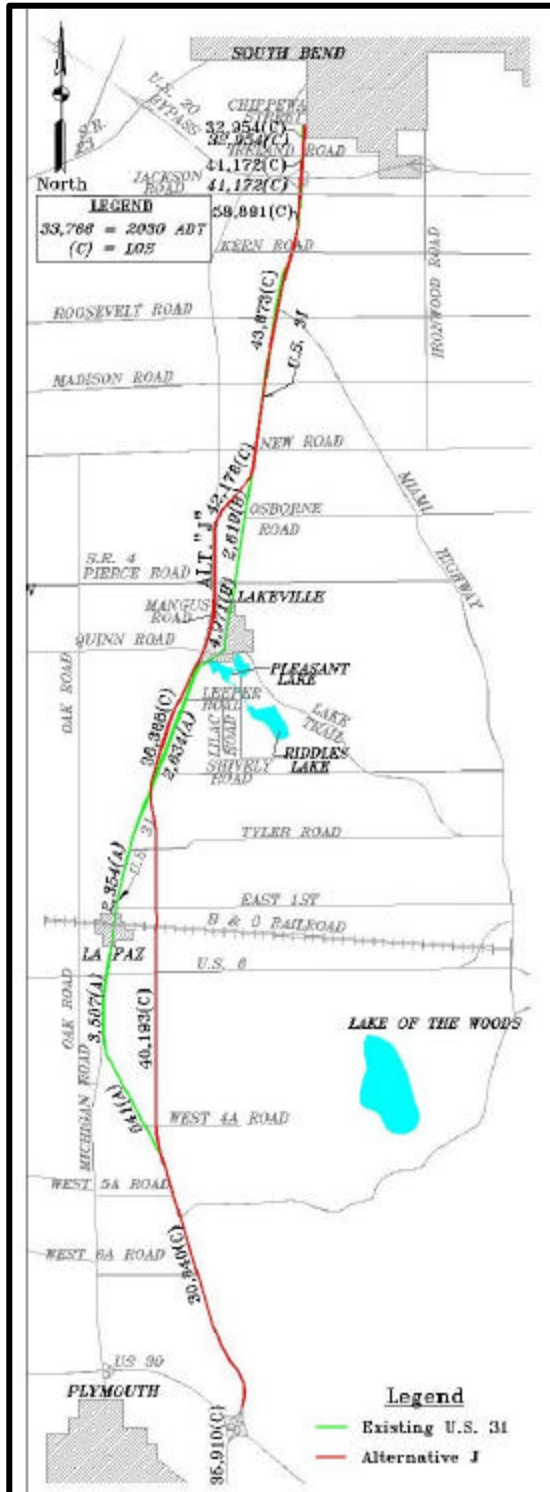
Alternative I fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.



## US31 Plymouth to South Bend

### Screening Report

#### 4.12 Alternative J



Alternative J begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It follows the alignment of US 31 from Shively Road (south of Lakeville) to Quinn Road, departs the US 31 alignment west of Lakeville near an abandoned railroad, returns to US 31 south of New Road, and ends at the existing US 20/US 31 interchange. Alternative J is 20.2 miles in length, with preliminary costs estimated at \$346 million.

#### Phase 1: Purpose and Need

**Reduce Congestion:** This alternative would reduce congestion of US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

**Improve Traffic Safety:** This alternative would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No Build is 96%.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

Alternative J meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

#### Phase 2: Social and Environmental Impacts

The potential social and environmental impacts identified for Alternative J are listed in Table 4.2.1 in **Section 4.2**. This alternative would require an estimated 857 acres of new right-of-way, of which, 55 acres are forested, 28 acres are wetlands, 11 acres are floodplains, and 702 acres are farmland. Approximately eight (8) streams would be crossed by the alternative.

Alternative J would result in approximately 235 residential, 86 business, and ten (10) farm

relocations. In addition, this alternative would impact a 48-unit apartment complex. Many of the residence and business relocations are located along the existing US 31. This alternative would



also impact the Center Township Fire Department, and could potentially impact the La Paz wastewater treatment plant.

Alternative J would impact thirteen (13) potential hazardous material sites including: eight (8) USTs, two (2) LUSTs, and three (3) RCRA sites.

This alternative would also potentially impact four (4) managed lands, which include one (1) classified forests, one (1) classified wildlife areas, O'Brien Park, and Newton Park. O'Brien Park is located along US 31, just north of Ireland Road, and Newton Park is located along US 31 near Pierce Road.

Potential Section 4(f) sites include O'Brien Park, Newton Park, the Ullery/Farneman House, an Italiante-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register), and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 4.2.1). Due to the close proximity of these two properties, it will be difficult to construct a freeway type facility in this area without significant impact to one or both properties. Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact.

Alternative J is adjacent to both the Newton Park in Lakeville and the LaVille Jr.-Sr. High School. Shifting Alternative J to the west to avoid the park and school would make it essentially the same as Alternatives B, C, D, E and F of which Alternatives C, E, and F have been carried forward for further analysis.

It will also impact two (2) previously surveyed archaeological sites, none of which were recommended for intensive survey.

This alternative crosses two (2) well-head projection areas.

### **Conclusion**

**Alternative J is being eliminated from further consideration based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 5.0 contains those alternatives eliminated from further consideration.**

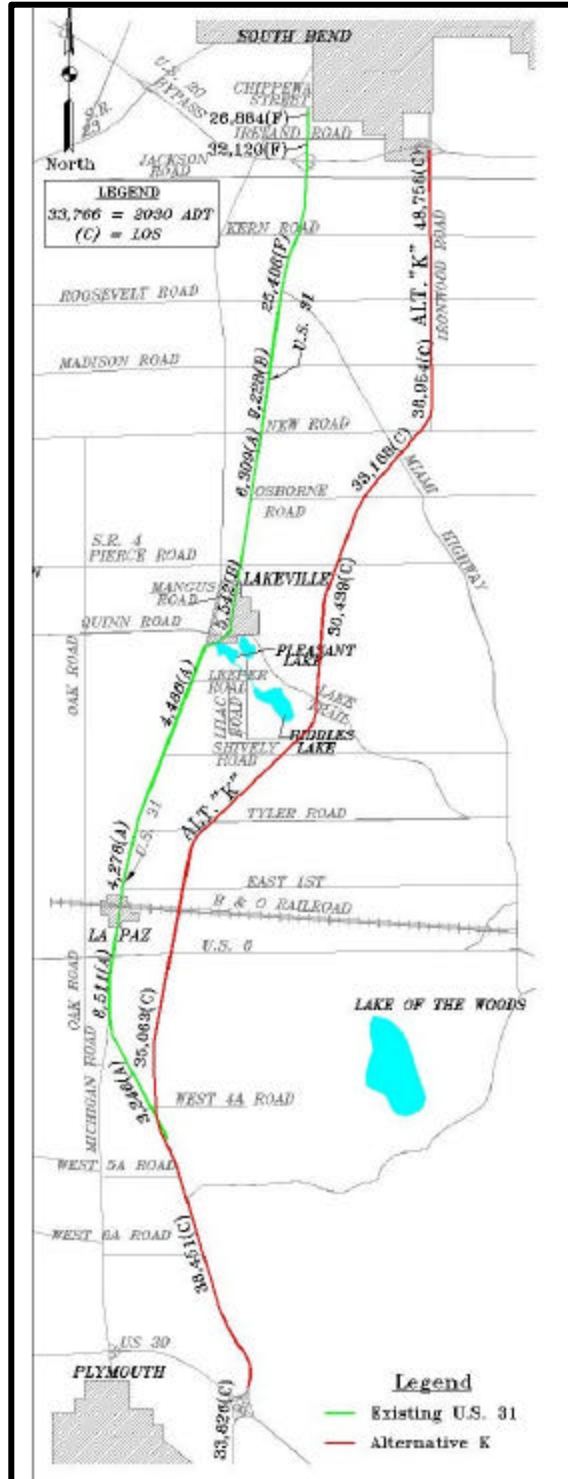




## US31 Plymouth to South Bend

### Screening Report

#### 4.13 Alternative K



Alternative K begins at the existing US 31/30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 east of an abandoned railroad. It runs east of Lakeville, angles over to Ironwood Road near New Road, follows the Ironwood Road alignment and ends at the existing US 20 Bypass/Ironwood Road interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), New Road, Kern Road, and the US 20 Bypass. Alternative K is 20.5 miles in length, with preliminary costs estimated at \$268 million.

#### Phase 1: Purpose and Need

**Traffic Congestion:** This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, one (1) of the eight (8) segments of existing US 31 has an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions.

**Traffic Safety:** This alternative poorly addresses the purpose of improving safety on the existing US 31 because the residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety.

**Consistency with Transportation Plans:** This alternative is consistent with the INDOT 2000-2025 Long Range Plan and with the MACOG Transportation Plan.

#### Conclusion

Alternative K fails to address the first purpose and need for the project (i.e., reduced congestion). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.



### 4.14 Screening of Options 1 & 2 (Alternatives B – F)

Figure 4.14.1: Options 1 & 2 for Alternatives B - F



Alternatives B – F each consist of two (2) Options and are listed in the tables as B1, B2, C1, etc. The Options are each 3.4 miles in length and differ in terms of their associated environmental impacts. Option 1 diverts to use the existing US 31 for 1.7 miles before leaving the existing US 31 alignment just south of Lakeville, while Option 2 follows the abandoned railroad corridor east of US 31, then crosses to the west of the existing alignment south of Lakeville (Figure 4.14.1).

#### Phase 1: Purpose and Need

The screening process for Options 1 and 2 differed from that of the individual alternatives in that differences in purpose and need measures are expected to be negligible. Thus, the Options were directly advanced to Phase 2, the social and environmental screening, and were viewed in terms of advantages and disadvantages.

#### Phase 2: Social and Environmental Impacts

##### 4.14.1 Option 1 (Alternatives B – F)

This Option utilizes the existing US 31 alignment for approximately 1.7 miles south of Lakeville.

#### Advantages:

- This Option uses more of the existing US 31 right-of-way.
- It impacts approximately 34 acres **less** of forest than Option 2.
- It impacts approximately 8 acres **less** of wetlands than Option 2.

#### Disadvantages:

- This Option impacts two (2) historic sites potentially eligible for the National Register of Historic Places.
- It would require 30 **more** residential relocations than Option 2.
- It would require 4 **more** farm relocations than Option 2.



- It would require 3 **more** business relocations than Option 2.
- This Option would have **higher** overall costs due to more relocations and construction of frontage roads.
- It would require **greater** maintenance of traffic during construction.
- There is a **higher** potential for utility relocations associated with this Option.

#### **4.14.2 Option 2 (Alternatives B – F)**

##### **Advantages:**

- No sites on or potentially eligible for the National Register would be impacted by this Option.
- Option 2 follows an abandoned railroad corridor.
- It would require 30 **less** residential relocations than Option 1.
- It would require 4 **less** farm relocations than Option 1.
- It would require 3 **less** business relocations than Option 1.
- This Option would have **lower** overall costs due to fewer relocations and no need for frontage roads.
- It would require **less** maintenance of traffic during construction than Option 1.
- There is a **lower** potential for utility relocations associated with this Option.

##### **Disadvantages:**

- This Option uses **less** of the existing US 31 right-of-way.
- It impacts approximately 34 acres **more** of forest than Option 1.
- It impacts approximately 8 acres **more** of wetlands than Option 1.

#### **Conclusion**

Given the higher residential, farm, and business relocations, impacts to potential historic sites, and higher overall cost, Option 1 is not recommended to be advanced for further study. For Alternatives B – F, discussed in the following sections, only Option 2 will be used to screen each alternative.